

A. Cover Sheet (*Attach to front of proposal.*)

1. Specify: ☒ agricultural project or ☒ individual application or
☐ urban project ☐ joint application
2. Proposal title—concise but descriptive: Main Canal Modernization Project to Partially Address CALFED Quantifiable Objectives 6 and 7
3. Principal applicant—organization or affiliation: Anderson-Cottonwood Irrigation District
4. Contact—name, title: Dee Swearingen, General Manager
5. Mailing address: 2810 Silver Street, Anderson, CA 96007-4297
6. Telephone: 530/365-7329
7. Fax: 530/365-7623
8. E-mail: acid@shasta.com
9. Funds requested—dollar amount: \$3,727,000 (Phase 1: \$205,000; Phase 2: \$525,000; Phase 3: \$2,910,000; Other Tasks: Task 4 [O&M cost-share element, no funds requested]; Task 5: \$87,000)
10. Applicant cost share funds pledged—dollar amount: \$386,000 (present worth of O&M activities)
11. Duration—(month/year to month/year): July 2001 to December 2003
12. State Assembly and Senate districts and Congressional district(s) where the project is to be conducted: State Assembly District 2 (Richard Dickerson), State Senate District 4 (K. Maurice Johannessen), Congressional District 2 (Wally Herger)
13. Location and geographic boundaries of the project: Anderson-Cottonwood Irrigation District Service Area, which spans an area from Redding to about 2 miles south of the Shasta-Tehama County boundary in a portion of CALFED Quantifiable Objectives Sub-Region 1
14. Name and signature of official representing applicant. By signing below, the applicant declares the following:
 - the truthfulness of all representations in this proposal
 - the individual signing the form is authorized to submit the application on behalf of the applicant
 - the applicant will comply with contract terms and conditions identified in Section 11 of this PSP

Dee E. Swearingen
(printed name of applicant)

February 14, 2001
(date)

(signature of applicant)

B. Scope of Work

Relevance and Importance

Abstract

The Anderson-Cottonwood Irrigation (ACID or District) diverts water from the Sacramento River via gravity diversion at the seasonal ACID diversion dam in Redding. The District also operates a pump station on the river several miles downstream to supply a lateral canal. ACID's distribution system includes approximately 35 miles of Main Canal, about 98 percent of which is unlined. Several wasteways are located along the canal route, which return water to the Sacramento River and local streams when flow exceeds the canal capacity.

The ACID Main Canal Modernization Project is a three-phase project intended to improve water management. The District is unmetered and has flow measurement capabilities at only one Main Canal location. Control has historically been limited to managing the head gate near the river, with surpluses spilling at wasteways. Canal seepage is significant in sections near natural drainages, where soils are fast draining and the canal contributes directly to the underlying groundwater basin. This proposal identifies the necessary site selection, design, construction, construction management, and post-construction monitoring level of effort and related costs to implement the following elements of the ACID Main Canal Modernization Project:

- Water measurement and control at 13 locations along the ACID Main Canal, through construction/retrofit of gated concrete structures
- Automation through the installation of supervisory control and data acquisition (SCADA) facilities integrated with the water measurement and control structures
- Lining of approximately 2 miles of Main Canal in areas particularly subject to seepage

This project will partially address CALFED Quantifiable Objectives 6 and 7 by reducing Sacramento River diversions and decreasing non-productive evapotranspiration (ET) resulting from operational spills and seepage. Reliability and flexibility of irrigation deliveries will be improved, benefiting District customers. There are no Priority Outcomes in Sub-Region 1 associated specifically with the Sacramento River or this project.

Consistency with Local and Regional Water Management Plans

Local Water Management Initiatives. ACID is one of 14 Redding Area Water Council (RAWC) members working on a regional plan to solidify the Basin's water resources through 2030. This proposal is consistent with the plan; it will help to quantify water requirements at key District locations and provide better information on seepage rates from the District's unlined canals. Data from monitoring ACID's system will help to enhance the RAWC surface-water/groundwater model and evaluate future water management options.

Basin-wide Water Management Plan. ACID is among the Sacramento Valley Settlement Contractors who are partners with the U.S. Bureau of Reclamation (Reclamation) in developing the Sacramento River Basin-wide Water Management Plan (BWMP) with the assistance of the California Department of Water Resources (DWR)). This proposed project would implement some of the water use efficiency recommendations of the BWMP.

California Public Policy. The California Constitution and California Water Code prohibit "waste or unreasonable use" of water and exclude from water rights any water that is not reasonably required

for beneficial use. The State Water Resources Control Board (SWRCB) places water conservation conditions on water rights permits that it approves.

Central Valley Project Improvement Act and State Water Project Policy. The CVPIA calls for water conservation criteria to promote the “highest level of water use efficiency reasonably achievable by project contractors.” Some SWP contracts include conservation requirements, and some water right granted to the SWP by the SWRCB include specific conservation requirements.

CALFED Bay-Delta Program and Linkage to Quantifiable Objectives. CALFED’s Water Use Efficiency (WUE) Program and Quantifiable Objectives (QO) are intended to help ensure that California’s water is used efficiently and provides multiple benefits. The proposed project will contribute directly to Sub-Region 1 (Redding Sub-basin) QOs 6 and 7 by reducing Sacramento River diversions and reducing spillage and seepage from the ACID Main Canal, respectively. CALFED has not defined Priority Outcomes for the Sacramento River in Sub-Region 1.

Need for Project

A keystone of each water management program discussed above is the ability to measure water use to quantify the success of conservation programs. The CVPIA Criteria for Evaluating Water Management Plans require that all water deliveries are measured to within 6-percent accuracy and at least a portion of the water is priced by volume. The CALFED Water Use Efficiency Program has QOs for water management improvements that can be measured to ensure that such improvements occur. CALFED, in association with the California Legislature, CALFED agencies, and stakeholders, is developing legislation to require appropriate water use measurement for all California water users.

This proposal is an initiative to develop the capability to measure and precisely control flows through its distribution system to satisfy CALFED and CVPIA water management and measurement criteria. Flow measurement capability, automation, and canal lining will better enable ACID to manage its water supplies, develop and implement conservation measures, and quantify the success of those measures pursuant to QOs 6 and 7 to benefit all Californians and the Bay-Delta ecology.

Nature, Scope, and Objectives of Project

The project would provide automated flow control structures and measurement capabilities. The proposed structures would automatically adjust to changing canal water levels influenced by fluctuating river levels and downstream irrigation demands. The resulting spills reduction would reduce both river diversions and ET losses in drainages receiving spills. Canal lining would correct significant seepage and further reduce river diversions and ET losses. The flow measurement component would improve the District’s capability to track river diversions, quantify losses and conservation benefits, and more efficiently schedule and synchronize diversions with grower needs. Improved measurement capabilities would also enhance the District’s contribution to the local and regional water management and planning initiatives described above. The scope of this project includes:

- Modifications to motor for existing radial gate headworks structure
- Construction of three new concrete control structures with motor-operated slide gates
- Replacement of 9 canal turnouts with new concrete structures and motor-operated slide gates
- SCADA systems for monitoring and control at each of the 13 new/retrofit structures
- Installation of measurement flumes at each of the 13 new/retrofit structures

- Concrete lining of Main Canal, two reaches totaling about 2 miles in length

The project objectives are to improve measurement and control of the ACID delivery system, reducing operational spills and seepage (pursuant to QO 7), and reducing Sacramento River diversions (QO 6). Beyond the Quantifiable Objectives, the project would also benefit ACID customers by improving the reliability and flexibility of irrigation water deliveries.

Technical/Scientific Merit, Feasibility, Monitoring, and Assessment

Technical Merit, Methods, Procedures, and Facilities

The project is predicated on standard engineering practices and has no experimental or technically unproven elements. Implementation of the ACID Main Canal Modernization Project is envisioned to be a three-phase effort, each divided into distinct tasks. Phases and Tasks are as follows:

Phase 1 – Reconnaissance and Feasibility Studies and Preliminary Design

Task 1A: Data Collection and Mapping. We will collect/review existing information to determine feasibility and identify specific locations to install gate structures, measurement flumes, and SCADA equipment. Preliminary geotechnical data will be gathered to confirm seepage locations and extent.

Task 1B: Environmental Reconnaissance. Biological field surveys, resource database review, and other reconnaissance will determine permitting requirements and the appropriate level of required environmental documentation. This task will also identify sensitive areas or issues of environmental concern related to site selection.

Task 1C: Preliminary Design. Information collected in Tasks 1A and 1B will help identify sites for improvements and types of facilities. Sufficient design will be completed to estimate construction cost and establish the Preferred Alternative for NEPA/CEQA compliance. Meetings with affected landowners will ensure cooperation and coordination prior to proceeding further at each location. Criteria for site selection will include accessibility, potential for environmental impacts, site topography and geotechnical characteristics, cost, and hydraulic considerations. General locations and design flows that have been identified for the three new control structures are as follows:

- North of Anderson near Clear Creek, 300 cubic feet per second (cfs)
- South of Anderson near Anderson High School, 250 cfs
- North of Cottonwood, near Gas Point Road and Interstate 5, 100 cfs.

Each of the nine turnout structures would be replaced in its current location. Measurement flumes and SCADA facilities would be sited in conjunction with the control structures and turnouts. SCADA information would consist primarily of water level readings at each structure, equipment status, and flows tied to rating curves for the measurement flumes. SCADA repeaters would be installed on high terrain in sight of the canal. This task will also include gathering additional geotechnical information and topographic surveys at selected sites as needed for final design.

Phase 2 – Final Design, Permitting, and Environmental Documentation

Task 2A: Design. Facilities will be designed for site and hydraulic conditions and sized for existing in-channel flows. New control structures are expected to be standard concrete canal checks with motor-operated slide gates (MOSG) mounted on breastwalls. Turnouts will require new concrete headwalls with MOSG. Replough flumes would be used for measurement. Lining is expected to be reinforced shotcrete, but other methods/products, such as clay, may be evaluated for cost and performance. Construction plans and specifications will be developed to facilitate bidding for one or multiple construction contracts.

Task 2B: Permitting and Environmental Documentation. Key issues in the NEPA/CEQA environmental document (anticipated to be an Environmental Assessment/Initial Study [EA/IS]) relate to canal lining and, possibly, secondary groundwater recharge impacts and elimination of habitat. Task 2B involves scoping, an administrative draft coordinated with preliminary design, public review draft, and final draft. Permits are anticipated to be limited to NPDES stormwater-related approvals and, potentially, U.S. Army Corps of Engineers and California Department of Fish and Game permits/agreements where streams and/or jurisdictional wetland areas are affected.

Environmental documentation and permitting is identified as a task in this phased project. For the timing of this task in relation to grant funding requirements, please see Section H, Environmental Restoration, at the end of this proposal.

Phase 3 – Construction

Task 3A: Construction. Construction includes installing control and measurement facilities, SCADA systems, and canal lining. It is expected that most of the construction activity will need to occur between November and March, when ACID is not delivering irrigation water.

Task 3B: Construction Management and Inspection. An engineering consultant will administer the construction contract and inspect the work for compliance with the contract documents. Services will include processing the contractor's pay requests, reviewing construction submittals, materials testing, and startup procedures.

Other Tasks

Task 4: Operation and Maintenance (O&M). O&M of all new facilities and equipment is proposed to be accomplished by the District as an in-kind, cost-sharing service.

Task 5: Contract Management and Administration. This task incorporates management of project costs and schedule, administering grant funds, developing work plans, coordinating with other entities and agencies, and overseeing activities of the project team.

Quantifiable Objectives Linkage

This is an "action-specific" proposal under the WUE Program. "Action-specific" proposals provide details about proposed actions and a rough estimate of the contribution toward a QO. The following paragraphs describe the QO linkage to each major project component.

Water Control, Automation, and Measurement. The new/retrofitted canal structures would automatically adjust to changing canal water levels, as influenced by fluctuations in Sacramento River flows and downstream irrigation needs. The resulting reduction in operational spills would reduce both river diversion and ET losses in the drainage courses receiving the spills. Flow measurement would enhance the District's capability to track river diversions, quantify losses and conservation benefits, and schedule and synchronize diversions with grower needs. It is estimated that, through improved control, automation, and measurement, annual Sacramento River diversions may be reduced by as much as 7.5 percent, or 10,000 acre-feet, by reducing operational spills. A portion of ACID's spills return to the river through natural or man-made watercourses, and reduced spills, therefore, may not add "new" flow to the river. However, delay and water quality degradation associated with spills are undesirable and warrant control. The significant portion that does not return to the river is lost through ET. Thus, reduction in operational spills will decrease non-productive ET (per QO 7) and increase river flows by a corresponding amount (QO 6).

Canal Lining. Canal lining would significantly reduce seepage, contributing to both applicable Redding Basin QOs. Canal lining along about 2 miles of high-seepage sandy areas may reduce seepage by about 10,000 acre-feet per year, based on canal dimensions and a seepage loss rate of 17

inches per day for a 180-day irrigation season. This loss rate reflects the seepage difference between an unlined canal in sandy soil (20 inches per day) and a concrete-lined canal (3 inches per day).

Seepage along ACID's Main Canal contributes in part to groundwater. Because the canal is elevated above surrounding terrain over the majority of its length, a significant portion of the seepage also resides at or near the ground surface outside the canal. This portion ultimately evaporates or is transpired by nearby grass and vegetation. Reduction or elimination of this component of the seepage contributes directly to QO 6 and QO 7.

Schedule

Figure 1, project schedule, includes a breakdown of tasks, deliverables, and milestone dates. Figure 2 summarizes costs by Task and distributes costs over the project duration by quarter. Note that for clarity of the other tasks, none of the cost share expenditure associated with Task 4 O&M appears on Figure 2, because O&M will not commence until the remainder of the project is completed.

Monitoring and Assessment

Information from each measuring facility will be compiled as a routine O&M task and made available to Reclamation and DWR. The appropriate level/frequency of data collection will be determined in consultation with Reclamation and DWR. The three additional measurement points along the Main Canal and on nine laterals will enable the District to monitor deliveries and losses. In addition to comparing flows from various points in the system, it will be possible to compare flows at the existing USGS gage near Sharon Street in Redding with new flows measured in the upper reaches of the canal to compare historical river diversions to post-project diversions.

C. Outreach, Community Involvement, and Information Transfer

Project Outreach and Benefits

The project is an outgrowth of the Sacramento River Basin-wide Water Management Plan (BWMP) and implements BWMP recommendations. The BWMP, being developed by most Sacramento Valley agricultural water contractors in association with Reclamation and DWR, has a strong public information and involvement component. During BWMP development, numerous presentations were made among participating "Settlement Contractors" with DWR and Reclamation staff. Informational meetings were held with Settlement Contractor Boards of Directors, water users, and environmental interest groups to solicit stakeholder input and disseminate information about the BWMP.

The project provides the capability to more flexibly and efficiently manage the amount and timing of diversions and reduce diversions (increasing instream flows), spill, ET, and seepage losses. Reduced diversions and losses, combined with higher instream flows, would benefit all downstream users and improve aquatic ecosystem conditions. Optimized management of irrigation water supplies makes more water potentially available for other beneficial uses and benefits all Californians.

Training, Employment, and Capacity Building

The project does not directly involve training, employment, or capacity building, but through more efficient agricultural water supply management, it potentially makes more water available for beneficial uses. According to the *Community Assessment Project Report* (Shasta Regional Community Foundation and United Way of Northern California, 2000) Shasta County (i.e., Redding Basin and CALFED Sub-Region 1) typically has higher unemployment (6.6 percent in 1999) and

lower average per capita income (31st out of 58 California counties in 1999) and median family income (19 percent lower than 1997state average) than the rest of the state. A better managed water supply will help sustain the gains being made in the northern California economy by accommodating growth in industry and agriculture, providing growth in employment opportunities in all economic sectors.

Figure 1

Figure 2

Disseminating Information

The planning effort associated with the BWMP provides a formal framework for disseminating project information. Feedback on benefits achieved through the BWMP-recommended management and conservation measures will be made available to all Sacramento Valley water contractors, Reclamation, and DWR through the BWMP partnership. The participants are aware of the need to share this information to ensure successful water supply management throughout the Sacramento Valley.

Letter of Notification

ACID notified the Shasta and Tehama County Boards of Supervisors and the Shasta County Planning Department. A copy of the letter is attached to this proposal.

D. Qualifications of the Applicants, Cooperators, and Establishment of Partnerships

The resume of Dee Swearingen, ACID General Manager, is attached. Mr. Swearingen will administer the contract, oversee the work, and provide all required documentation to DWR.

External Cooperators

It is not anticipated that the project will require additional assistance from any other entity or agency. ACID will coordinate with landowners who may be affected by project construction.

Partnerships

The proposed project is an outgrowth of the BWMP and will further build on partnerships established among the Settlement Contractors, Reclamation, and DWR. ACID would help to strengthen these partnerships through this proposed project by increasing instream flows to the benefit of downstream users. Shared information on water saved as a result of project implementation may help to promote similar water management and conservation projects in other Sacramento Valley basins.

E. Costs and Benefits

Budget Summary and Breakdown

Table 1 shows costs by task, cost category, and year in year 2000 dollars not adjusted for inflation. Tasks 1A, 1B, 1C, 2A, 2B, and 3B will be performed by an engineering consultant. Task 3A will be performed by a construction contractor. Tasks 4 and 5 will be performed by ACID employees.

Budget Justification

Salaries and Wages

Salaries and wages associated with Task 5, Contract Management and Administration, include 80 hours per month for the ACID General Manager for Task 5, described in Section B.

Supplies

See discussion under Cost Share Contribution below.

Service Contracts – Construction

Construction costs reflect facilities described herein. About 60 percent of the cost is associated with canal structures (gates, flumes, SCADA) and 40 percent with lining the canal. The estimate includes a 25-percent contingency, but does not include environmental mitigation or land acquisition costs.

Travel

Travel costs associated with Task 5 Contract Management and Administration were estimated at \$100 per month, primarily for driving to meetings and potential facility sites.

Other Direct Costs – Consultants

Estimated engineering effort reflects the number and type of structures to be designed and constructed and data collection and site selection processes necessary to proceed with design. It is expected that this project will result in 13 new or modified canal structures and about 10,000 feet of canal lining. The engineering effort includes preparation of construction plans and specifications, topographic surveying, geotechnical investigations, and construction inspection. Consultant services also include preparation of an EA/IS, NPDES stormwater-related approvals, and, potentially, U.S. Army Corps of Engineers and California Department of Fish and Game permits.

Cost Share Contribution

The District's cost-share will include O&M of new facilities in perpetuity, commencing in the 2004 irrigation season. The value of the cost-share is anticipated to consist of three components:

1. Approximately \$15,000 per year labor for District field staff
2. Approximately \$10,000 per year for supplies related to O&M
3. Approximately \$100,000 at project life mid-point (i.e., after 15 years) to upgrade or recondition gates, flumes, and SCADA equipment and patch shotcrete canal liner

The present worth of these O&M activities is \$386,000, assuming a project life of 30 years and an interest rate of 6 percent per year

Benefit Summary and Breakdown

More flexible and efficient management of the amount and timing of Sacramento River diversions will reduce operational spillage, ET, and seepage losses. Sacramento River diversions may be decreased by as much as 20,000 acre-feet per year. Corresponding higher instream flows, which free water for other beneficial uses, would benefit all downstream users and improve aquatic ecosystem conditions.

The project would benefit ACID customers by improving the reliability and flexibility of irrigation water deliveries. Improved control and measurement capabilities would enhance the District's contribution to the local and regional water management initiatives described above. These are not quantifiable benefits, but more accurate information is inherently beneficial to farmers and water management planners.

ACID would benefit through the avoided cost of eventual rehabilitation of the nine Main Canal turnouts to be replaced. The improved headworks radial gate structure motor is an avoided cost benefit.

Assessment of Costs and Benefits

Project costs are shown in Table 1. There would be no real reduction in District labor associated with this project. Deferred replacement would, however, constitute a quantified benefit for the headworks structure and the nine Main Canal turnouts. Perhaps most significantly, the reduced Sacramento River diversion also represents a quantified benefit. The potential savings of 20,000 acre-feet per year represent a manageable volume of water available for other beneficial uses, such as:

- Instream flows for fish or other aquatic species
- Wildlife refuges
- Water banking programs.

A typical current price for the Environmental Water Account is \$50 per acre-foot. Other programs pay a much higher cost, but for this analysis and comparison of project costs and benefits, we have assumed the \$50 per acre-foot rate. Benefits to ACID customers related to improved reliability and flexibility, and benefits to local and regional water management and planning initiatives, are considered “non-quantified” benefits because no specific monetary value can reasonably be assigned.

Table 2 summarizes the quantified costs from Table 1, and further develops a present value for quantified benefits. Non-quantified benefits are also shown. A 6-percent interest rate is assumed, along with a 30-year project life, where applicable.

F. Matching Funds Commitment Letter

If the project is selected for funding, ACID will provide an institutional cost-sharing agreement letter signed by an official authorized to commit ACID to the matching share.

G. Letter of Concurrence from Local Government

If the project is selected for funding, ACID will provide a letter signed by an official authorized to declare that this project is compatible with existing programs, the local general plan, and other local and regional activities.

H. Environmental Documentation

Timing of Environmental Documentation and Permitting in Relation to Project Funding

The solicitation (page 13, Item H) states that permitting and environmental documentation requirements must be met prior to funding disbursement. This phased project includes environmental documentation and permitting as project tasks. Phase 1 of the project, Reconnaissance Studies and Preliminary Design, includes Task 1B to identify project permit requirements and the appropriate level of required NEPA and CEQA environmental documentation. NEPA/CEQA documentation may be tiered off the CALFED Programmatic EIS/EIR and incorporate appropriate mitigation measures from the CALFED Record of Decision. The permitting requirements and appropriate level of NEPA/CEQA documentation (i.e., EA/IS versus EIS/EIR) cannot be identified until preliminary studies are completed and preliminary design is underway during Phase 1. All necessary permits identified during Phase 1 will be acquired and environmental documentation will be completed during Phase 2, prior to initiation of construction. Funding of Phases 1 and 2 will, therefore, culminate in completion of the environmental documentation and permitting requirements before construction is initiated.

Attachments

Table 1
Budget Summary and Breakdown

Table 1
ACID Main Canal Modernization Project
Budget Summary and Breakdown

[illegible]

Table 2
Summary of Quantified and Non-quantified
Costs and Benefits

Table 2
ACID Main Canal Modernization Project
Summary of Quantified and Non-Quantified Costs and Benefits

[illegible]

Project Manager Resume
Dee Swearingen, ACID General Manager

Letters of Notification
